

ABSTRACT

A compact, low profile splicing system for joining optical fibers produces durable, low transmission loss fusion splices. The system employs active optical techniques such as profile alignment or local injection and detection to achieve optimized alignment of the fibers prior to fusion. Light injected into one fiber is propagated across the interface to a second fiber. A detector senses the intensity of the injected light in the second fiber. After the relative position of the fibers is manipulated to maximize the transmitted intensity, the fibers are fusion spliced using an electric arc discharge. The accurate alignment achievable using the local injection and detection system to drive adaptive fiber positioning affords a method for reliably producing low loss splices. The present system is compact and low in profile, making it operable in cramped quarters with limited clearance to adjacent equipment and structures and with only a minimal amount of free fiber slack available. Simplicity of design and operation make the system rugged and enable accurate alignment and low loss fusion of fibers under adverse working conditions.